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AUTHOR Moskowitz, Joel M.; And Others
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ABSTRACT

This study provides a follow-up assessment of an innovative drug education program for seventh and eighth graders. Students learned Lasswell's framework for understanding human needs and motives, a systematic decision-making procedure, and information about the pharmacological, psychological, and social consequences of licit and illicit drug use. The course focused primarily upon "soft" drug use--tobacco, alcohol, and marijuana. One social studies class from each of nine matched pairs was randomly assigned to receive the drug education course. The remaining classes constituted the control group. The follow-up questionnaire was administered one year after the completion of the course. Testing covered (1) drug knowledge; (2) general attitudes toward drug use; (3) perceived benefits and costs of various types of substance use; (4) perceived peer attitudes toward, and use of, various substances; and (5) intentions to use, current use, and lifetime use of various substances. The only short-term effect of the course that sustained at follow-up was greater drug knowledge for grade 8 males. As compared to their controls, the experimental students were more opposed to hard drug use. (Author/GK)

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# An Evaluation Of An Innovative Drug Education Program: Follow-Up Results

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Pacific Institute for Research
and Evaluation
905 Jefferson Street
Napa, California 94558

Joel M. Moskowitz, Ph.D.
Eric Schaps, Ph.D.
Janet Malvin, Ph.D.
Gary Schaeffer, Ph.D. Cand.
John W. Condon, Ph.D.

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## Abstract

This study provides a follow-up assessment of an innovative drug education program for seventh and eighth graders. The course was taught by an outside instructor and consisted of ten sessions conducted once per week in social studies classes. In the course, students learned a) Lasswell's framework for understanding human needs and motives, b) a systematic decision-making procedure, and c) information about the pharmacological, psychological, and social consequences of licit and illicit drug use. The course focused primarily upon "soft" drug use--tobacco, alcohol, and marijuana.

One social studies class from each of nine matched pairs was randomly assigned to receive the drug education course. The remaining classes constituted the control group. Within each group there were approximately 175 students. The follow-up questionnaire was administered one year after the completion of the course. Testing covered a) drug knowledge, b) general attitudes toward drug use, c) perceived benefits and costs of various types of substance use, d) perceived peer attitudes toward, and use of, various substances, e) intentions to use, current use, and lifetime use of various substances.

Class-level analyses of variance and covariance were performed on the follow-up data. The only short-term effect of the course that sustained at follow-up was greater drug knowledge for grade 8 males. The short-term positive effects for grade 7 females on drug knowledge, perceptions of peer attitudes toward and peer use of soft drugs, and personal involvement in alcohol and marijuana use were not obtained at follow-up. The two grade-sex groups that were not influenced by the course initially, grade 7 males and grade 8 females, remained unaffected.

For grade 8 males and grade 7 females, a delayed effect on attitudes toward "hard" drug use was obtained. As compared to their controls, these experimental students were more opposed to hard drug use. These positive outcomes may be spurious, or they may be evidence of "sleeper" effects.

## INTRODUCTION

This paper provides a follow-up assessment of an innovative drug education program. Unlike previous drug education efforts, this course emphasized the decision-making process rather than information about drugs. Although factual information was provided in the course, most of the class time was spent a) teaching Lasswell's framework for understanding motives and needs (Lasswell and Rubenstein, 1966), b) teaching a systematic decision-making process, c) examining the personal and social consequences of drug use decisions, and d) identifying alternatives to drug use in various choice situations. The focus was primarily upon "soft" drug use--cigarettes, alcohol, and marijuana. The course was taught by an outside instructor and consisted of ten class sessions conducted once per week in social studies classes.

The study employed an experimental design and utilized process data as well as pretest, posttest, and follow-up outcome data. The report on this study evaluating the course and its effects at posttest (the short-term effects) (Schaps, Moskowitz, Condon and Malvin [Note 1]) noted that:

> "the course was often too technical and fast-paced for the students, and that it was only partially successful at involving the broad range of students in class discussions and activities. Overall, students gave the course mediocre ratings with respect to interest, enjoyableness, usefulness, and clarity, and classroom teachers were critical of the instructor's teaching style and the course content."

In spite of the course's shortcomings, outcome data obtained at the end of the course revealed that:

> "the course produced a pattern of predicted effects for grade 7 females but not for grade 7 males or grade 8 males or females. For grade 7 females, the course increased drug knowledge, decreased perceptions of favorable peer attitudes toward soft drug use, and decreased personal involvement in use of both alcohol and marijuana. Few significant effects were obtained for any of the other three subgroups."

Besides the effects that occurred for the grade 7 females, the only other effect attributable to the course was greater drug knowledge among the grade 8 males.

The present study investigated whether the treatment effects obtained for the grade 7 females and grade 8 males sustained a year later. The study also explored whether any new treatment effects appeared for any of the grade-sex groups.

# METHOD

## Assignment of Classes to Condition

This study was conducted at a junior high school (grades 7-9) in a predominantly white, middle-class, suburban community of approximately 50,000 in Northern California.

Eighteen social studies classes were paired on grade level (seven or eight), ability group level (low or heterogeneous), and student pretest data on current use of alcohol, tobacco, and marijuana.[1] One class in each pair was then randomly assigned to receive the drug education course (experimental condition) during the second semester of the 1978-1979 school year, and the other class served as an untreated control group.

The subjects for the study were 500[2] students enrolled in the experimental (N = 244) and control classes (N = 256) at the beginning of the second semester of the 1978-1979 school year. Seventy-two percent of these students (N = 358) responded to all questionnaires. Attrition was similar for both conditions. Six students from each condition were deleted from the analysis because they reported significant use of a bogus drug. This drug was included on the questionnaire to identify students who exaggerated their drug use.

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[1]Five additional classes were dropped from the design because appropriate matches could not be made.

[2]Fifteen students were not included because their parents declined to allow them to participate.

Survey Adminsitration Procedures

The pretest was conducted in October 1978, the posttest in May 1979, and the follow-up posttest in May 1970. Four trained substitute teachers administered the questionnaires. A make-up session was held for students who were absent for the original session.

To enhance the confidentiality induction questionnaires were labeled with student names on the cover sheet and identification numbers on page one. In a prepared statement, administrators assured students of complete confidentiality and explained the need for identification numbers as a way of tracking students over time. Students were instructed to tear off the cover page that displayed their names.

Instrumentation

A different version of the Drug and Alcohol Survey questionnaire (DAS) was employed for the pretest than for the two posttests. This version contained somewhat different item wordings, response formats, and scales than the posttest version. The scales were derived from a theoretical causal model and empirical scaling analyses. Multiple group confirmatory factor analyses were applied to DAS inter-item correlation matrices. These matrices were computed on separate pretest and posttest random samples composed of students from several junior high schools.[3] The resultant scales appear in Table 1 with their internal consistency reliabilities estimated by coefficient alpha. The reliabilities obtained were adequate for all scales except Drug Knowledge.[4]

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[3]The matrices were computed using pair-wise deletion of missing data and communalities were inserted into their diagonal elements.

[4]Because the Drug Knowledge items were difficult there may have been a substantial amount of guessing which lowered internal consistency.

# TABLE 1

DRUG AND ALCOHOL SURVEY PRETEST AND POST-TEST SCALES AND INTERNAL CONSISTENCY RELIABILITIES (COEFFICIENT ALPHA)

| SUBSCALE NAME | RELIABILITY | |
|---|---|---|
| | PRETEST[a] | POST-TEST[b] |
| General Drug Attitudes (General Att) | .92 | .93 |
| Perceived Benefits of Alcohol Use (Alc Benefits) | .85 | .85 |
| Perceived Benefits of Marijuana Use (Pot Benefits) | .89 | .91 |
| Perceived Costs of Alcohol Use (Alc Costs) | NA[c] | .84 |
| Perceived Costs of Marijuana Use (Pot Costs) | NA | .90 |
| Attitudes Toward Soft Drug Use (Soft Att) | .79 | .76 |
| Drug Knowledge (Knowledge) | NA | .40 |
| Perceived Peer Attitudes Toward Soft Drugs (Soft Peer Att) | .87 | .84 |
| Perceived Peer Use of Soft Drugs (Soft Peer Use) | NA | .82 |
| Involvement in Alcohol Use (Alc Involve) | .92 | .88 |
| Involvement in Cigarette Use (Cig Involve) | .92 | .91 |
| Involvement in Marijuana Use (Pot Involve) | .95 | .95 |
| Perceived Benefits of Pill Use (Pill Benefits) | .92 | .91 |
| Perceived Costs of Pill Use (Pill Costs) | NA | .89 |
| Perceived Peer Attitudes Toward Hard Drugs (Hard Peer Att) | .96 | .96 |
| Perceived Peer Use of Hard Drugs (Hard Peer Use) | NA | .96 |
| Attitudes Toward Hard Drug Use (Hard Att) | .93 | .93 |
| Involvement in Inhalant Use (Inh Involve) | .86 | .70 |
| Involvement in Barbiturate Use (Barb Involve) | .84 | .89 |
| Involvement in Amphetamine Use (Amp Involve) | .88 | .90 |
| Involvement in Cocaine Use (Coc Involve) | .75 | .88 |
| Involvement in PCP Use (PCP Involve) | .83 | .86 |
| Involvement in LSD Use (LSD Involve) | .70 | .87 |
| Involvement in Heroin Use (Heroin Involve) | .93 | .77 |

[a] N = 473
[b] N = 586
[c] NA indicates that this scale was not administered.

Pretest and posttest reliabilities for equivalent scales are highly consistent despite some differences in item wordings and response formats. The psychometric properties of these instruments have been reported by Moskowitz, Schaeffer, Condon, Schaps, and Malvin (Note 2).

The General Drug Attitudes (General Att) scale consists of 17 statements that assess general attitudes toward licit and illicit substance use. Subjects responded to items on five-point scales ranging from "strongly agree" to "strongly disagree." Items were scored such that high scores indicate "pro-drug" attitudes.

The Perceived Benefits of Alcohol Use (Alc Benefits), Marijuana Use (Pot Benefits), and "Pill" Use (Pill Benefits), and the Perceived Costs of using these same drugs (Alc Costs, Pot Costs, and Pill Costs) were measured by separate scales. Each Benefits scale consisted of eight questions describing possible benefits of using the substance. Subjects responded on four-point scales ranging from "does not help at all" to "helps very much" to indicate whether they saw the drug as instrumental in achieving the proposed benefits. Each Costs scale consisted of five statements describing possible adverse consequences of using the substance. Subjects responded on four-point scales ranging from "strongly agree" to "strongly disagree" that use of the drug will produce the adverse effects.

The Perceived Peer Attitudes Toward Soft Drugs (Soft Peer Att) scale measured subjects' perceptions of the attitudes of other students in their grade toward use of the "soft" or "gateway" substances: alcohol, cigarettes, and marijuana. The corresponding hard drug scale--Perceived Peer Attitudes

Toward Hard Drugs (Hard Peer Att)--assessed perceived peer attitudes toward the use of inhalants, barbiturates or tranquilizers, amphetamines or stimulants, cocaine, PCP, LSD or psychedelics, and heroin or morphine. Subjects responded to each substance on five-point scales ranging from "a very bad thing" to "a very good thing."

The Perceived Peer Use of Soft Drugs (Soft Peer Use) and Perceived Peer Use of Hard Drugs (Hard Peer Use) scales assessed subjects' perceptions of the prevalence of soft and hard drug use among students in their grade. Subjects indicated their prevalence estimate for each substance by using six-point scales ranging from "very few (0%)" to "about three-fourths or more (75% - 100%)" of peers.

The Attitude Toward Soft (Soft Att) and Hard (Hard Att) Drug Use scales assessed subjects' own attitudes toward use of the two sets of drugs. The response formats were identical to the Perceived Peer Attitudes scales.

Substance Involvement scales were computed for each of the ten drugs: alcohol (Alc Involve), cigarettes (Cig Involve), marijuana or hashish (Pot Involve), inhalants (Inh Involve), barbiturates or tranquilizers (Barb Involve), amphetamines or stimulants (Amp Involve), cocaine (Coc Involve), PCP (PCP Involve), LSD or psychedelics (LSD Involve), and heroin or morphine (Her Involve). Each scale consisted of three items assessing current use[5] lifetime use, and intentions to use[6].

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[5]Operationalized on the pretest as "during the past three months" and on the two posttests as "during the last four weeks,"

[6]Operationalized on the pretest as "during the next two years" and on the two posttests as "during the next year."

The Drug Knowledge (Knowledge) scale consisted of seven multiple-choice items measuring pharmacological knowledge. Each item had one correct response and several distractors. The Knowledge scale score is the number of correct responses.

Data Analysis

The experimental design involved random assignment of classes to the experimental and control conditions. Because least-squares analysis techniques assume the statistical independence of observations, treating individual student responses as independent when students share a common classroom environment is problematic. The likelihood of obtaining a spurious treatment effect would be increased under this analysis strategy. Hence, class mean data were analyzed.

Classroom means were computed for pretest and posttest measures separately for each sex. This approach allows control for and examination of the relationship between student sex and treatment effects. Separate analyses were then conducted for males and females at each grade level to avoid problems with heterogeneity of variance and covariance.

Univariate analyses of variance and covariance were the primary analysis strategies. Due to the small number of classes in this study ($n$ = 4 or 5), statistical analyses were lacking in power. To compensate for this problem, we have set Type I error for each analysis at .10. Since we conducted many univariate analyses, isolated effects must be interpreted cautiously, because they may be due to experiment-wise Type I error. Hence, interpretation of results is based on patterns in the data rather than single findings.

Rules were set for handling missing data in computing scale scores. A scale score was computed for a student if at least 60% of the items comprising that scale were present. Any missing item score was replaced by the mean for that item in the appropriate cell of the experimental design. This procedure utilized most of the item data and provided unbiased cell means. When more than 40% of the items comprising a scale were missing, the student received a missing value for that scale, and the case was not employed in computing the class mean for that scale.

# Results

## Initial Equivalence

Initial equivalence of experimental and control groups was assessed. The means and standard deviations for all pretest, posttest and follow-up posttest measures are summarized in Table 2 for each grade, sex, and treatment condition. For all variables except Knowledge, a low score is desirable. The posttest results have been discussed by Schaps et al. (Note 1). The follow-up results will be discussed later in this report.

Analyses of variance were performed on the pretest measures with treatment condition as the factor. No significant differences were obtained for grade 7 males or grade 8 males or females. For grade 7 females, significant differences were obtained on two of the 17 pretest variables. As compared to controls, experimental students were more pro-drug on Pill Benefits, $F$ (1,6) = 5.77, $p$ <.10, and Barb Involve, $F$ (1,6) = 7.29, $p$ <.05. Thus, evidence for the initial equivalence of the experimental and control groups was substantial.

## Analysis of Follow-up Data

A one-way analysis of covariance was conducted on each follow-up measure with the corresponding pretest employed as covariate.[7] For several follow-up

[7]Analyses were also conducted on the posttest data for the same sample of students that completed the follow-up posttest. In spite of the sample differences due to the additional attrition incurred by the time of the follow-up, the results from these analyses replicated the results obtained by Schaps et al, Note 1.

## TABLE 2

DESCRIPTIVE STATISTICS BY GRADE LEVEL BY SEX BY TREATMENT CONDITION

| | | GRADE 7 | | | | | | | | GRADE 8 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MALE STUDENTS | | | | FEMALE STUDENTS | | | | MALE STUDENTS | | | | FEMALE STUDENTS | | | |
| | | Experimental | | Control | | Experimental | | Control | | Experimental | | Control | | Experimental | | Control | |
| Scale | Test | M | SD | M | SD | M | SD | M | SD | M | SD | M | SD | M | SD | M | SD |
| General Att | Pre | 2.10 | .36 | 1.93 | .38 | 1.96 | .25 | 2.07 | .38 | 2.56 | .48 | 2.27 | .26 | 2.30 | .21 | 2.17 | .25 |
| | Post | 2.26 | .22 | 2.12 | .29 | 2.15 | .44 | 2.29 | .35 | 2.72 | .35 | 2.56 | .48 | 2.42 | .20 | 2.32 | .37 |
| | Follow-up | 2.34 | .07 | 2.34 | .38 | 2.24 | .37 | 2.25 | .26 | 2.55 | .20 | 2.69 | .30 | 2.67 | .29 | 2.53 | .47 |
| Alc Benefits | Pre | 1.63 | .34 | 1.45 | .11 | 1.59 | .21 | 5.83 | 1.46 | 1.88 | .52 | 1.61 | .21 | 1.70 | .20 | 1.62 | .17 |
| | Post | 1.78 | .24 | 1.62 | .30 | 1.74 | .19 | 1.71 | .20 | 1.94 | .26 | 1.89 | .36 | 1.86 | .13 | 1.80 | .19 |
| | Follow-up | 1.70 | .30 | 1.82 | .37 | 1.98 | .27 | 1.82 | .32 | 1.89 | .27 | 2.04 | .28 | 2.06 | .31 | 1.88 | .31 |
| Pot Benefits | Pre | 1.55 | .32 | 1.46 | .15 | 1.60 | .18 | 1.55 | .22 | 2.10 | .56 | 1.69 | .27 | 2.01 | .32 | 1.84 | .28 |
| | Post | 1.67 | .24 | 1.69 | .42 | 1.69 | .15 | 1.80 | .24 | 2.05 | .28 | 2.02 | .37 | 2.08 | .21 | 1.93 | .46 |
| | Follow-up | 1.71 | .19 | 1.91 | .46 | 2.03 | .51 | 1.87 | .44 | 1.97 | .33 | 2.08 | .30 | 2.19 | .37 | 1.99 | .40 |
| Alc Costs | Post | 2.14 | .19 | 1.97 | .26 | 1.98 | .20 | 1.94 | .25 | 2.15 | .17 | 2.48 | .41 | 1.96 | .18 | 2.14 | .26 |
| | Follow-up | 1.99 | .31 | 2.16 | .52 | 2.05 | .23 | 1.97 | .14 | 2.15 | .21 | 2.48 | .23 | 2.24 | .19 | 2.24 | .61 |
| Pot Costs | Post | 1.83 | .21 | 1.87 | .47 | 1.86 | .23 | 1.92 | .23 | 2.26 | .25 | 2.31 | .38 | 2.18 | .07 | 2.12 | .40 |
| | Follow-up | 1.84 | .27 | 1.98 | .30 | 2.09 | .43 | 1.95 | .33 | 2.16 | .37 | 2.32 | .26 | 2.34 | .24 | 2.34 | .59 |
| Soft Att | Pre | 1.81 | .07 | 1.75 | .45 | 1.87 | .17 | 1.79 | .18 | 2.37 | .45 | 1.99 | .15 | 2.28 | .33 | 2.02 | .26 |
| | Post | 2.07 | .37 | 1.96 | .38 | 1.98 | .24 | 2.26 | .29 | 2.53 | .29 | 2.71 | .54 | 2.44 | .15 | 2.30 | .31 |
| | Follow-up | 2.26 | .29 | 2.21 | .27 | 2.11 | .35 | 2.20 | .25 | 2.37 | .28 | 2.68 | .41 | 2.67 | .18 | 2.65 | .49 |
| Knowledge | Post | 2.56 | .56 | 2.13 | .74 | 2.08 | .55 | 1.46 | .21 | 3.33 | .46 | 2.04 | .29 | 2.97 | .50 | 2.46 | .37 |
| | Follow-up | 2.54 | .53 | 2.56 | .57 | 2.54 | .38 | 2.33 | .14 | 3.54 | .68 | 2.82 | .34 | 3.21 | .59 | 2.70 | .22 |
| Soft Peer Att | Pre | 1.87 | .16 | 2.16 | .39 | 2.49 | .36 | 2.17 | .23 | 2.91 | .14 | 3.02 | .11 | 3.25 | .67 | 3.34 | .37 |
| | Post | 2.37 | .19 | 2.56 | .41 | 2.78 | .30 | 3.02 | .24 | 2.97 | .27 | 3.31 | .42 | 3.43 | .44 | 3.26 | .33 |
| | Follow-up | 3.01 | .61 | 2.80 | .29 | 2.93 | .32 | 3.39 | .68 | 3.18 | .34 | 3.21 | .32 | 3.56 | .32 | 3.26 | .15 |
| Soft Peer Use | Post | 22.38 | 9.20 | 22.38 | 10.61 | 25.58 | 7.04 | 38.87 | 5.75 | 42.42 | 8.84 | 43.96 | 4.83 | 47.83 | 5.42 | 50.81 | 12.23 |
| | Follow-up | 35.12 | 5.46 | 32.65 | 6.79 | 40.70 | 5.53 | 46.68 | 6.70 | 47.27 | 15.12 | 42.65 | 7.88 | 50.04 | 2.74 | 52.01 | 9.68 |

Table 2 (continued)

| | | GRADE 7 | | | | | | | | GRADE 8 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MALE STUDENTS | | | | FEMALE STUDENTS | | | | MALE STUDENTS | | | | FEMALE STUDENTS | | | |
| | | Experimental | | Control | | Experimental | | Control | | Experimental | | Control | | Experimental | | Control | |
| Scale | Test | M | SD | M | SD | M | SD | M | SD | M | SD | M | SD | M | SD | M | SD |
| Alc Involve | Pre | 2.20 | .39 | 2.29 | .57 | 1.90 | .24 | 2.06 | .49 | 2.87 | .60 | 2.60 | .50 | 2.45 | .61 | 2.71 | .36 |
| | Post | 2.33 | .38 | 2.46 | .66 | 1.77 | .27 | 2.31 | .50 | 2.79 | .23 | 2.74 | .33 | 2.72 | .33 | 2.51 | .44 |
| | Follow-up | 2.47 | .30 | 2.55 | .32 | 2.14 | .12 | 2.27 | .31 | 2.84 | .38 | 3.06 | .50 | 2.83 | .33 | 2.72 | .37 |
| Cig Involve | Pre | 1.62 | .63 | 1.54 | .65 | 1.49 | .38 | 1.73 | .50 | 2.14 | .52 | 1.85 | .22 | 2.07 | .55 | 2.42 | .71 |
| | Post | 1.56 | .45 | 1.71 | .51 | 1.56 | .38 | 2.30 | .50 | 2.14 | .38 | 1.95 | .42 | 2.23 | .24 | 2.43 | .67 |
| | Follow-up | 1.79 | .32 | 1.89 | .28 | 1.87 | .25 | 2.30 | .37 | 2.16 | .49 | 2.05 | .37 | 2.51 | .25 | 2.67 | .53 |
| Pot Involve | Pre | 1.19 | .20 | 1.42 | .39 | 1.16 | .17 | 1.26 | .17 | 2.20 | .77 | 1.74 | .21 | 1.84 | .58 | 1.73 | .36 |
| | Post | 1.45 | .50 | 1.79 | .84 | 1.24 | .24 | 1.72 | .39 | 2.46 | .78 | 2.29 | .46 | 2.37 | .58 | 1.97 | .57 |
| | Follow-up | 1.66 | .40 | 1.97 | .52 | 1.56 | .57 | 1.75 | .38 | 2.47 | .56 | 2.48 | .51 | 2.65 | .43 | 2.33 | .65 |
| Pill Benefits | Pre | 1.35 | .20 | 1.37 | .12 | 1.54 | .16 | 1.29 | .12 | 1.72 | .50 | 1.56 | .32 | 1.55 | .22 | 1.61 | .20 |
| | Post | 1.49 | .23 | 1.45 | .24 | 1.56 | .09 | 1.39 | .13 | 1.64 | .24 | 1.64 | .52 | 1.73 | .26 | 1.70 | .39 |
| | Follow-up | 1.47 | .33 | 1.44 | .19 | 1.73 | .20 | 1.59 | .30 | 1.67 | .29 | 1.82 | .42 | 1.86 | .28 | 1.67 | .49 |
| Pill Costs | Post | 1.61 | .26 | 1.62 | .36 | 1.67 | .13 | 1.55 | .14 | 1.80 | .11 | 1.88 | .27 | 1.87 | .25 | 1.91 | .43 |
| | Follow-up | 1.53 | .31 | 1.55 | .17 | 1.66 | .20 | 1.61 | .23 | 1.73 | .31 | 2.09 | .43 | 2.08 | .23 | 1.88 | .51 |
| Hard Peer Att | Pre | 1.26 | .11 | 1.47 | .26 | 1.83 | .38 | 1.51 | .10 | 2.04 | .16 | 2.05 | .38 | 2.18 | .30 | 2.23 | .33 |
| | Post | 1.85 | .09 | 1.66 | .16 | 2.02 | .34 | 2.06 | .09 | 2.13 | .36 | 2.68 | .53 | 2.36 | .33 | 2.42 | .60 |
| | Follow-up | 2.33 | .31 | 1.98 | .29 | 2.16 | .25 | 2.12 | .44 | 2.21 | .32 | 2.33 | .37 | 2.64 | .48 | 2.29 | .27 |
| Hard Peer Use | Post | 9.31 | 9.48 | 3.84 | 2.11 | 7.03 | 1.80 | 8.83 | 4.28 | 13.31 | 8.15 | 17.95 | 5.87 | 16.84 | 8.08 | 16.75 | 3.22 |
| | Follow-up | 12.52 | 4.83 | 9.66 | 5.67 | 10.72 | 4.05 | 11.75 | 2.42 | 11.65 | 4.51 | 11.37 | 2.59 | 22.58 | 10.40 | 15.23 | 7.93 |
| Hard Att | Pre | 1.26 | .18 | 1.16 | .16 | 1.28 | .12 | 1.26 | .19 | 1.55 | .37 | 1.42 | .24 | 1.50 | .21 | 1.29 | .18 |
| | Post | 1.36 | .14 | 1.30 | .15 | 1.43 | .21 | 1.56 | .34 | 1.81 | .34 | 1.78 | .35 | 1.61 | .16 | 1.49 | .22 |
| | Follow-up | 1.42 | .17 | 1.35 | .13 | 1.27 | .09 | 1.49 | .25 | 1.60 | .16 | 1.95 | .44 | 1.83 | .33 | 1.67 | .56 |
| Inh Involve | Pre | 1.13 | .13 | 1.06 | .04 | 1.02 | .02 | 1.25 | .32 | 1.22 | .31 | 1.50 | .54 | 1.10 | .13 | 1.09 | .10 |
| | Post | 1.21 | .25 | 1.09 | .06 | 1.10 | .10 | 1.21 | .22 | 1.38 | .25 | 1.49 | .43 | 1.12 | .10 | 1.12 | .17 |
| | Follow-up | 1.04 | .05 | 1.13 | .13 | 1.07 | .08 | 1.17 | .15 | 1.26 | .21 | 1.39 | .39 | 1.19 | .14 | 1.21 | .31 |

Table 2 (continued)

| | | GRADE 7 | | | | | | | | GRADE 8 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MALE STUDENTS | | | | FEMALE STUDENTS | | | | MALE STUDENTS | | | | FEMALE STUDENTS | | | |
| | | Experimental | | Control | | Experimental | | Control | | Experimental | | Control | | Experimental | | Control | |
| Scale | Test | M | SD | M | SD | M | SD | M | SD | M | SD | M | SD | M | SD | M | SD |
| Barb Involve | Pre | 1.05 | .07 | 1.02 | .02 | 1.06 | .02 | 1.01 | .03 | 1.11 | .20 | 1.23 | .28 | 1.14 | .24 | 1.22 | .25 |
| | Post | 1.14 | .18 | 1.04 | .07 | 1.00 | .00 | 1.16 | .22 | 1.21 | .31 | 1.24 | .18 | 1.33 | .25 | 1.17 | .24 |
| | Follow-up | 1.01 | .01 | 1.10 | .15 | 1.07 | .12 | 1.08 | .14 | 1.23 | .26 | 1.20 | .16 | 1.37 | .29 | 1.32 | .52 |
| Amp Involve | Pre | 1.06 | .10 | 1.05 | .09 | 1.01 | .02 | 1.03 | .06 | 1.14 | .21 | 1.25 | .27 | 1.19 | .26 | 1.27 | .46 |
| | Post | 1.22 | .17 | 1.04 | .07 | 1.01 | .02 | 1.12 | .18 | 1.28 | .32 | 1.49 | .31 | 1.29 | .27 | 1.23 | .26 |
| | Follow-up | 1.05 | .04 | 1.10 | .15 | 1.08 | .11 | 1.20 | .14 | 1.31 | .31 | 1.39 | .21 | 1.55 | .30 | 1.46 | .64 |
| Coc Involve | Pre | 1.03 | .06 | 1.03 | .06 | 1.03 | .07 | 1.00 | .00 | 1.15 | .16 | 1.12 | .15 | 1.11 | .16 | 1.07 | .07 |
| | Post | 1.14 | .18 | 1.00 | .00 | 1.03 | .03 | 1.13 | .11 | 1.35 | .16 | 1.55 | .34 | 1.23 | .13 | 1.22 | .26 |
| | Follow-up | 1.05 | .04 | 1.10 | .20 | 1.04 | .04 | 1.30 | .27 | 1.31 | .26 | 1.44 | .35 | 1.43 | .37 | 1.52 | .69 |
| PCP Involve | Pre | 1.02 | .04 | 1.00 | .00 | 1.00 | .00 | 1.01 | .03 | 1.05 | .10 | 1.16 | .21 | 1.22 | .36 | 1.01 | .01 |
| | Post | 1.13 | .18 | 1.00 | .00 | 1.00 | .00 | 1.03 | .05 | 1.15 | .25 | 1.28 | .28 | 1.15 | .17 | 1.19 | .18 |
| | Follow-up | 1.00 | .00 | 1.09 | .17 | 1.01 | .02 | 1.06 | .13 | 1.05 | .12 | 1.07 | .07 | 1.14 | .22 | 1.17 | .33 |
| LSD Involve | Pre | 1.00 | .00 | 1.00 | .00 | 1.00 | .00 | 1.00 | .00 | 1.04 | .09 | 1.10 | .21 | 1.04 | .10 | 1.03 | .05 |
| | Post | 1.19 | .16 | 1.03 | .06 | 1.00 | .00 | 1.03 | .05 | 1.22 | .34 | 1.19 | .19 | 1.14 | .15 | 1.13 | .22 |
| | Follow-up | 1.01 | .01 | 1.10 | .18 | 1.01 | .02 | 1.17 | .20 | 1.09 | .12 | 1.13 | .08 | 1.24 | .23 | 1.19 | .32 |
| Her Involve | Pre | 1.01 | .02 | 1.02 | .04 | 1.17 | .28 | 1.03 | .04 | 1.12 | .27 | 1.11 | .23 | 1.10 | .15 | 1.05 | .11 |
| | Post | 1.17 | .16 | 1.00 | .00 | 1.01 | .02 | 1.03 | .05 | 1.21 | .28 | 1.23 | .21 | 1.02 | .15 | 1.03 | .04 |
| | Follow-up | 1.00 | .00 | 1.11 | .21 | 1.00 | .00 | 1.04 | .09 | 1.06 | .13 | 1.07 | .05 | 1.09 | .14 | 1.07 | .11 |

measures that did not have a corresponding pretest measure, an alternative pretest measure was employed. Soft Att was used as the covariate for Alc Costs, Pot Costs, and Pill Costs, and Soft Peer Att was employed for Soft Peer Use. Analysis of variance was performed on Knowledge since no suitable covariate was available for this variable. ANOVA was also performed on Hard Peer Att, Hard Peer Use, Inh Involve, Barb Involve, Amp Involve, Coc Involve, PCP Involve, LSD Involve, and Her Involve, because the pretest scores did not predict the corresponding follow-up scores.

The results from analysis of the follow-up data are summarized in Table 3. Positive treatment effects were obtained for grade 7 females on Hard Att and for grade 8 males on Knowledge and Hard Att. No significant treatment effects were obtained for grade 7 males or grade 8 females.

Table 4 compares effect sizes for significant treatment effects that occurred at posttest or follow-up. For grade 7 females, none of the significant treatment effects obtained at posttest were significant at follow-up. Inspection of the group means (see Table 2) on these variables revealed that after the posttest, drug involvement increased more rapidly in the experimental group than in the control group. The positive treatment effect obtained on Hard Att at follow-up was considerably larger than the nonsignificant effect obtained at posttest. After the posttest, the experimental group became more anti-drug than the control group.

For grade 8 males, the positive treatment effect obtained on Knowledge at posttest replicated at follow-up although it had diminished in size. A new treatment effect was obtained on Hard Att at follow-up. After the posttest the experimental group became more anti-drug; whereas, the control group became less anti-drug.

# TABLE 3

## SUMMARY OF COVARIANCE ANALYSES

| | Grade 7 Males | | Grade 7 Females | |
|---|---|---|---|---|
| Follow-up Measure | B[a] | F(1,5) | B[a] | F(1,5) |
| General Att | .26 | <1 | .84 | <1 |
| Alc Benefits | .70 | 1.72 | .71 | <1 |
| Pot Benefits | .74 | 1.84 | 1.77 | <1 |
| Alc Costs | .98 | 1.25 | .55 | <1 |
| Pot Costs | .33 | <1 | .81 | <1 |
| Soft Att | .25 | <1 | .79 | <1 |
| Knowledge[b] | - | <1 | - | 1.08 |
| Soft Peer Att | .24 | <1 | -.25 | 1.14 |
| Soft Peer Use | 7.07 | 1.84 | 2.64 | 3.87 |
| Alc Involve | .47 | <1 | .58 | <1 |
| Cig Involve | .35 | <1 | .09 | 3.10 |
| Pot Involve | 1.00 | <1 | .82 | <1 |
| Pill Benefits | -.15 | <1 | .59 | <1 |
| Pill Costs | -.20 | <1 | .80 | <1 |
| Hard Att | .06 | <1 | .72 | 4.66** |
| Hard Peer Att[b] | - | 2.64 | - | <1 |
| Hard Peer Use[b] | - | <1 | - | <1 |
| Inh Involve[b] | - | 1.62 | - | 1.45 |
| Barb Involve[b] | - | 1.77 | - | <1 |
| Amp Involve[b] | - | <1 | - | 1.71 |
| Coc Involve[b] | - | <1 | - | 3.64 |
| POP Involve[b] | - | <1 | - | <1 |
| LSD Involve[b] | - | 1.11 | - | 2.28 |
| Her Involve[b] | - | 1.00 | - | 1.00 |

Table 3 (continued)

| Follow-up Measure | Grade 8 Males B[a] | Grade 8 Males F(1,7) | Grade 8 Females B[a] | Grade 8 Females F(1,7) |
|---|---|---|---|---|
| General Att | .10 | 1.15 | .48 | <1 |
| Alc Benefits | .02 | <1 | .09 | <1 |
| Pot Benefits | .06 | <1 | -.04 | <1 |
| Alc Costs | -.25 | 3.50 | .34 | <1 |
| Pot Costs | -.02 | <1 | .24 | <1 |
| Soft Att | .07 | 3.37 | .11 | <1 |
| Knowledge[b] | - | 4.45* | - | 3.30 |
| Soft Peer Att | .48 | <1 | -.24 | 3.40 |
| Soft Peer Use | 8.16 | <1 | 2.94 | <1 |
| Alc Involve | .19 | 1.02 | .13 | <1 |
| Cig Involve | .56 | <1 | .45 | <1 |
| Pot Involve | .60 | 1.80 | .00 | <1 |
| Pill Benefits | .38 | 1.07 | .59 | <1 |
| Pill Costs | -.17 | 1.84 | .41 | <1 |
| Hard Att | .50 | 6.25** | .07 | <1 |
| Hard Peer Att[b] | - | <1 | - | 2.06 |
| Hard Peer Use[b] | - | <1 | - | 1.58 |
| Inh Involve[b] | - | <1 | - | <1 |
| Barb Involve[b] | - | <1 | - | <1 |
| Amp Involve[b] | - | <1 | - | <1 |
| Coc Involve[b] | - | <1 | - | <1 |
| PCP Involve[b] | - | <1 | - | <1 |
| LSD Involve[b] | - | <1 | - | <1 |
| Her Involve[b] | - | <1 | - | <1 |

[a]B refers to the unstandardized regression coefficient of follow-up on its corresponding pretest.

[b]Analysis of variance was conducted on this variable. Error df are 6 for grade 7 and 8 for grade 8.

*p <.10
**p <.05

# TABLE 4

TREATMENT EFFECT SIZES FOR SELECTED MEASURES

| Measure | Grade 7 Females | | Grade 8 Males | |
|---|---|---|---|---|
| | Posttest | Follow-up | Posttest | Follow-up |
| Knowledge | 2.95 | 1.50 | 3.07 | 2.12 |
| Soft Peer Att | 1.75 | .76 | -[a] | -[a] |
| Soft Peer Use | 2.45 | 1.39 | -[a] | -[a] |
| Alc Involve | .80 | .13 | -[a] | -[a] |
| Pot Involve | .97 | .32 | -[a] | -[a] |
| Hard Att | .47 | .96 | .29 | 1.00 |

NOTE: Posttest (follow-up) effect sizes are expressed in the metric of the posttest (follow-up) control group standard deviation. Effect sizes for all variables except Knowledge were adjusted for pretest differences.

[a]Treatment effects were nonsignificant at both posttest and follow-up.

# Discussion

Participation in the drug education course generally did not have a lasting impact on the students. Immediately after the course was completed (at posttest), grade 7 females showed positive effects on drug knowledge, perceptions of peer attitudes toward and peer use of soft drugs, and personal involvement in alcohol and marijuana use. One year later (at follow-up), however, these effects were not found. Grade 7 males and grade 8 females were unaffected at posttest and remained so at follow-up. For grade 8 males, a positive effect on drug knowledge was obtained at posttest, and it was found again at follow-up.

That drug education increased drug knowledge at posttest for two subgroups was not surprising. Many prior courses have increased knowledge about the nature and consequences of drug use (Hanson, 1981). As few studies collect follow-up data, little data exists concerning how long immediate effects sustain. In the present study, we find it puzzling that the initial effect on knowledge sustained for grade 8 males but not for grade 7 females. Perhaps some unknown characteristics of the grade 7 females caused their knowledge effect not to sustain. This discrepancy is not easily interpretable without reference to methodological or statistical artifacts. Greater knowledge about the populations in question may provide a substantive explanation.

An effect was evident at follow-up that did not emerge at posttest. For grade 8 males and grade 7 females, a delayed positive effect was obtained on attitudes toward hard drug use. Although not hypothesized, it is interesting that this effect occurred for the two grade-sex groups that showed immediate effects of the course, and that it occurred on the same variable for both groups.

The delayed attitude change regarding hard drug use may have been a "sleeper" effect. Sleeper effects operate when an intervention includes an explicit message (e.g., "hard drug use is harmful") although certain cues that accompany the message lead to its rejection (e.g., the instructor lacks credibility) (Cook, Gruder, Hennigan & Flay, 1979). After a period of time the message-rejection cues are forgotten (e.g., the source of the message), the message is believed, and attitude change occurs. In the present study, even though the students were critical of the instructor's teaching style, sleeper effects probably do not explain the changes in attitudes toward hard drug use because the "message" of the course focused on soft rather than hard drugs.

Our experimental design allowed for only a third of the junior high students to receive the drug education course. Furthermore, the course only had immediate positive effects on a minority of these students (i.e., the 7th grade females and 8th grade males). Over time these effects may have dissipated due to peer influences promoting recreational substance use. Such peer influences are particularly strong from early to middle adolescence (Huba and Bentler, 1980). In future studies, drug education may produce greater immediate effects as well as more lasting effects if it is provided to all students in the school rather than to specific groups of students.

## Reference Notes

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